

Bellwork: 10/18/12

Solve each absolute value equation.

1) $\frac{6|3x+2|}{6} = \frac{12}{6}$

$$|3x+2|=2$$

$$\begin{array}{rcl} 3x+2 & = & 2 \\ -2 & -2 & \\ \hline 3x & = & 0 \end{array} \quad \begin{array}{rcl} 3x+2 & = & -2 \\ -2 & -2 & \\ \hline 3x & = & -4 \end{array}$$

$$\frac{3x}{3} = \frac{0}{3}$$

$$\frac{3x}{3} = \frac{-4}{3}$$

$$\boxed{x=0 \quad x=-\frac{4}{3}}$$

2) $\frac{-5|x-7|}{-5} = \frac{19-4}{-5}$

$$\frac{-5|x-7|}{-5} = \frac{15}{-5}$$

$$|x-7| = -3$$

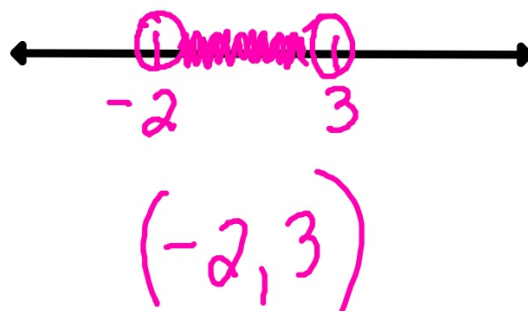
no solution

Solve each inequality. Answer in Interval Notation.

example 4:

$$|2x-1| < 5$$

$$\begin{array}{rcl} 2x-1 < 5 & & 2x-1 > -5 \\ +1 & +1 & +1 \quad +1 \\ \hline 2x < 6 & & 2x > -4 \\ x < 3 & & x > -2 \end{array}$$



example 5:

$$|2x+4| \geq 6$$

$$2x+4 \geq 6 \quad 2x+4 \leq -6$$

$$2x \geq 2 \quad 2x \leq -10$$

$$x \geq 1 \quad x \leq -5$$



example 6:

$$\frac{-2|3x-4|}{-2} \geq \frac{-12}{-2}$$

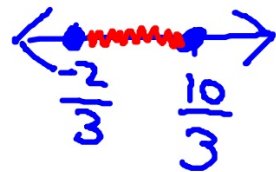
*divide by negative,
switch sign

$$|3x-4| \leq 6$$

$$\begin{aligned} 3x-4 &\leq 6 \\ 3x &\leq 10 \\ x &\leq \frac{10}{3} \end{aligned}$$

$$3x-4 \geq -6$$

$$\begin{aligned} 3x &\geq -2 \\ x &\geq -\frac{2}{3} \end{aligned}$$



$$\left[-\frac{2}{3}, \frac{10}{3}\right]$$

Special Cases:

example: 7

$$|2x+5| < -6 \quad \text{or} \quad |2x+5| > -6$$

positive < negative

No solution

$$2x+5 < -6$$

$$2x < -11$$

$$x < \frac{-11}{2}$$

$$2x+5 > 6$$

$$2x > 1$$

$$x > \frac{1}{2}$$

example: 8

positive > negative

$(-\infty, \infty)$

$$|3x + 5| \geq -12$$

positive \geq negative

no solution;

Write an absolute value inequality to model the situation:

Suppose you used an oven thermometer while baking and discovered that the oven temperature varied between +5 and -5 degrees from the setting. If your oven is set to 350 degrees, let t be the actual temperature.

